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THE PLANT DISEASE SURVEY

OFFICE OF MYCOLOGY AND DISEASE SURVEY

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FRUIT DISEASES

CLITOCYBE ROOT-ROT OF GRAPEFRUIT TREES

By A. S. Rhoads, Associate Pathologist,
Florida Agricultural Experiment Station

An interesting case of mushroom root-rot of grapefruit trees on rough lemon stock was recorded in December, 1929, based on pieces of diseased roots that were sent in for identification from Lake Alfred, Polk County, Florida. These roots exhibited the characteristic development of the mycelium of Clitocybe tabescens between the bark and the wood and in the inner bark. Cultures from these roots yielded, among various organisms, the rhizomorph-producing mycelium of this mushroom root-rot fungus. The grove in question was visited late in January and found to be one about 15 years of age. Ever since the property was purchased by the present owners about 7 years ago, an occasional tree has died on an area of about half an acre. The attention of the owners was first called to foot-rot on the crown roots, but recently in exploring the root system in more detail, numerous dead roots were found. Upon visiting the grove a few trees were found that exhibited a root-rot lesion on the root crown, extending but little above the ground line. Several trees exhibited old clusters of the mushrooms of Clitocybe tabescens which had developed from the roots and root crowns several weeks previously. Some of the trees under which old clusters of the mushrooms were found exhibited no evidence of girdling above the ground line but the tap roots were dead and more or less of the lateral roots were being killed. Most of the attacked trees exhibited but little or no decline in the tops but it is only a question of time until they go unless they can be treated so as to check the disease. Numerous instances of Clitocybe root-rot of various woody plants have been observed or reported from various parts of Florida during each of the past few years but this is the first instance where the disease has been definitely determined to attack citrus trees. This finding demonstrates the cause of one more trouble that has been confused with foot-rot in Florida during past years.

BARK-ROT OF ORANGE TREES

by A. S. Rhoads, Associate Pathologist,
Florida Agricultural Experiment Station

An unusual form of bark-rot was observed attacking orange trees on rough lemon stock in a grove near Eloise in Polk County, Florida, in December, 1929. The disease had attacked about 20 large trees approximately 20 years of age. Most of the attacked trees were confined to 4 rows of orange trees thought to be an inferior strain of Pineapple orange. The disease appeared much like foot-rot, but started at or above the bud union and extended upward from 2 to 3 feet, rapidly spreading around the trunks. In only one instance did the disease extend downward onto the roots. At the time of its discovery, some of the trees were from half to two-thirds girdled. The disease was characterized by the discoloration and death of the bark which developed a series of fine season checks in drying out. The disease was accompanied by a very scanty exudation of gum from the margins of the bark lesions. The diseased condition of the bark was so inconspicuous that it could very readily have been overlooked by a more casual observer until the trees became half or more girdled. The dead bark near the bases of the trees soon became invaded by flat-headed borers and was further characterized by a sour, ill-smelling odor and by the development of whitish masses of Fusarium spores. Upon cutting out the diseased bark down to the wood the underlying wood was found to have a dark discoloration.

The diseased trees were treated by cutting out all diseased bark slightly in advance of the discoloration, painting the scraped wood surface with lime-sulphur solution and subsequently applying a durable waterproof wound dressing. An attempt was made to isolate the causal organism from some of these trees before they were all treated. Fifty-one tubes of maltose agar were inoculated in the field with bits of the inner bark, taking careful aseptic precautions. Of these, 10 were from a tree with a small, newly developed bark lesion, 10 from very dark island-like patches of inner bark in a well-advanced case of the disease, and the remaining 31 from the discolored marginal bark of a well-advanced case of the disease. Of the first 10, 6 tubes developed Phomopsis citri; of the second 10 tubes, 7 developed a Fusarium apparently identical with that obtained in cultures from the masses of Fusarium spores on the dead bark in some cases; and of the 31 tubes cultured from the third tree, 2 developed Phomopsis citri. The balance of the tube cultures, with the exception of 2 that developed small bacterial colonies, remained sterile. It is believed that continued study of citrus bark and root diseases will enable us to segregate a number of troubles which have been confused with foot-rot in the past.

DEVITALIZATION OF TREES ON LEMON ROOTSTOCK

by A. S. Rhoads, Associate Pathologist,
Florida Agricultural Experiment Station

A characteristic decline of citrus trees, associated with heavy bearing and consequent crop strain in conjunction with general drought conditions, curtailed fertilization, defoliation and other injury from hurricanes, holding the fruit late in the season particularly on storm-injured trees, and other devitalizing influences, has become especially prominent in a number of localities in the ridge section and central part of the peninsula during the past 3 years. This trouble seems to be confined to trees on rough lemon or, in some cases, everbearing lemon, rootstock. It has been observed to develop most commonly on grapefruit and orange trees but occurs occasionally on tangerine trees. This trouble occurs most fre-

quently on trees that have attained an age of from 10 to 15 or more years and have reached the point of developing large crops of fruit, but occasionally occurs on younger trees. Although this form of tree decline has been observed to occur with more or less frequency for several years, it became especially prevalent during 1928 and 1929, following the hurricane of September, 1928. Many growers allude to it by the term "blight", which already covers a group of entirely different forms of tree decline.

Although the chlorotic condition of a large part of the foliage associated with crop strain, in itself, is not regarded as a serious matter, large numbers of trees so affected have lapsed into a characteristic type of decline. In the flush of growth subsequently developed the foliage is characterized by being abnormally small and by a dull, dingy, hard appearance like the foliage on affected limbs of blighted trees. On the growth developed following this symptom of tree decline the leaves become even smaller and conspicuously frenched at the ends of the branches. The more seriously affected twigs and branches die back rapidly. Frequently, however, they become defoliated but remain green for a time. The more vigorous of such twigs on seriously affected trees commonly exhibit extensive multiple bud formation as in exanthema. Trees that have lapsed into a general decline often bloom heavily shortly after the regular blooming period and may bloom sporadically during the summer - even up to late September. In this respect, the trees behave like blighted trees or certain types of water-injured trees although their mode of decline is quite different. The scanty amount of fruit set on declining trees is abnormally small, frequently being below commercial size. In addition, the fruit often exhibits an abnormal lumpy rind condition and, occasionally, a pronounced pitted condition.

After the top of the tree has declined somewhat a more or less vigorous growth of branches often develops in the lower part of the crown, the size and vigor of the foliage of these branches contrasting strongly with the devitalized appearance of the balance of the crown. Trees that have been headed back heavily frequently put out a good growth for a time but continue to decline later. After the tops of affected trees have declined extensively a more or less abundant development of watersprouts occurs from the main limbs at the base of the crown, as in blighted trees. No pronounced wilted condition of the foliage is evident, however, as invariably occurs in the so-called blighted trees.

Affected trees decline fairly rapidly even without the influence of hurricanes and dead twigs and branches may show up abundantly within the period of a year. The trees usually decline to such an extent in from 1 to 3 years, that they are worthless commercially. Trees affected by this decline often die out in spots through the grove, one or more trees developing the trouble after one has declined from it, or large areas of trees may develop the trouble simultaneously. This has suggested to some growers that the trouble is contagious. However, in most cases, the disease occurs more or less sporadically throughout the grove, with no particular system.

The roots of the trees developing this form of decline invariably show more or less dying and subsequent decay. The decline of the root system seems to be of rather general nature, apparently starting at the ends of the roots. The dying of roots may be observed on the taproot as well as on the lateral roots. All gradations from the death of small divisions of the roots to cases where entire lateral roots are dead back to the root crown may be found. In addition, the roots remaining alive frequently exhibit a dearth of fibrous feeding roots and the few that are present may be dead. In the cases that have been studied, the decline of the root system exhibits no evidence of having been caused by an organism. The failure of the root system is quite obviously responsible for the evidence of tree decline observed in the tops of the trees. In trees that have declined extensively a large proportion of the root system is found to be dead.

PHONY DISEASE OF PEACH

Since July 24th the phony disease of peach trees has been found in one new state (Texas) and in a number of additional counties in several of the states from which the disease had been previously noted. The new findings are as follows:

SOUTH CAROLINA	McCormick County
	Greenville County
	Spartanburg County
	York County
	Newberry County
	Orangeburg County
	Calhoun County
	Hampton County
ALABAMA	Tallapoosa County
	Talladega County
	Shelby County
	Autauga County
	Perry County
	Marengo County
	Sumter County
	Choctaw County
	Monroe County
	Conecuh County
	Butler County
	Lowndes County
	Bullock County
MISSISSIPPI	Oktibbeha County
	Webster County
	Calhoun County
	Grenada County
	Holmes County
	Jones County
LOUISIANA	Morehouse County
	Madison County
TEXAS	Smith County
	Henderson County
ARKANSAS	Ashley County
	Howard County

(K. F. Kellerman, August 14).

FRUIT DISEASES IN WASHINGTON

The following reports on diseases of apple, cherry, pear and prune were sent in by F. D. Heald, August 15.

APPLE

Scab (Venturia inaecualis). No scab has been reported this season from any localities in Eastern Washington, but it has been prevalent in severe form in a number of West Side districts.

Blight (Bacillus amylovorus). Twig blight has been reported from two different localities in Eastern Washington.

CHERRY

Leaf-spot (Coccomyces hiemalis). Reported from Seattle, Washington, on June 21.

Winter injury. Sweet cherries were severely injured in many localities, from complete killing to varying degrees of the delayed effects including blighting of blossoms, dropping of fruit, and death of limbs. The injury was most pronounced in most cases if the trees were from 20 to 25 years old.

PEAR

Winter injury. See Cherry. Much injury but no clear cut relation to age of trees. Same types as in cherry.

PRUNE

Rough bark. A case of very severe or pronounced corky development was reported from Walla Walla. Affected tree was adjacent to chicken yard and received too heavy nitrogenous fertilization.

OTHER APPLE DISEASES

VIRGINIA

Bitter-rot (Glomerella cingulata) was usually observed from three weeks to a month before the date of its first appearance here this year. The infections are very scattering. (A. B. Groves, August 15)

ILLINOIS

Sun scald. Unusually hot dry weather, at times reaching 110° F. has caused very serious sun scald on apples throughout southern and western Illinois. The loss by direct injury will be 2 to 3 per cent. Indirect drought injury will run much higher. (H. W. Anderson, August 15)

PEACH YELLOWS

CONNECTICUT

Yellows. Reported as quite serious in two orchards. (A. A. Dunlap, Aug. 15)

VIRGINIA

Yellows. A shipper's late red peach tree exhibiting the typical symptoms of yellows was observed in an orchard near Winchester on July 26. (A. B. Groves, July 26)

SMALL FRUIT DISEASES

GRAPE

Blight (Pestalozzia uvicola). Eighty per cent of the fruit on infected plants of the variety Brighton dropped. No infection found on the leaves. The plants had been neither sprayed nor dusted. (Massachusetts) (W. H. Davis, Aug.20)

Downy mildew (Plasmopara viticola). More or less prevalent on white grapes in Connecticut. (A. A. Dunlap, Aug. 15)

RASPBERRY

Winter injury in Minnesota. Winter injury and prolonged drought during the fruiting season seriously impaired the raspberry crop this year.

Anthracnose (Plectodiscella veneta) in Minnesota. The Nursery Inspection Division reports anthracnose unusually abundant on red raspberries throughout the State.

(Section of Plant Pathology, August 15)

STRAWBERRY

Chlorosis and Root rot in Arizona. Dwarfed, chlorotic strawberry plants, with blackened, terminally dry-rotted roots and brown to black lesions on the few remaining roots of normal color, have been received from Globe and several districts near Tucson. Rhizoctonia was present in abundance on diseased roots in all plants except one lot which was grown on alkali soil. Nematodes (Cacoнema radicicola) were found in minute galls on a few plants. (J. G. Brown, August 15)

CANTALOUPE DISEASES IN ARIZONA

Leak (Rhizopus sp.). Local merchants have reported unusual losses in cantaloupes. Examination of several crates of the decayed fruit, from which numerous cultures were made, gave Rhizopus and 3 species of Fusarium. Pure cultures of the species of Rhizopus inoculated into sound fruits resulted in the same "leaky" condition found in the market. The practice of hauling unrefrigerated consignments of cantaloupes in trucks from field to market probably is the most important factor in the cases reported.

Leathery rot. Three Fusaria, 2 salmon-colored and 1 white, isolated from cantaloupes grown in Arizona and obtained on the market in Tucson, were inoculated into sound fruits. The result in every case was a leathery rot surrounding the place of inoculation. Specimens inoculated in several places shrunk between the leathery spots; they were lumpy and irregular in shape and insipid in taste like those obtained at the market. Naturally infected fruits always produce an abundant growth of mycelium at the stem-end and from wounds.

(Brown and Evans, August 15)

CEREAL DISEASES

CEREAL DISEASES IN MONTANA

WHEAT

Bunt (Tilletia laevis) in Yellowstone County. Well controlled by copper-carbonate. Some farmers controlled it with formaldehyde; but others found that sprinkling wheat with formaldehyde gave poor control of bunt.

Bunt (Tilletia laevis) in Fallon County. Seriously abundant in Turkey wheat in which seed was treated by sprinkling with formaldehyde. Slight amounts present in fields where seed was dipped in formaldehyde or treated with 50 per cent coppercarbonate. Serious in a few fields of Marquis wheat where seed had been poorly treated.

Loose-smut (Ustilago tritici) on Marquis wheat in Fallon and Wibaux Counties. Usually 0.1 to 2 per cent of heads are affected. Probably climate usually too dry for serious spread of this fungus. It is usually present in spring wheat fields in similar percentages during most years.

Powdery mildew (Erysiphe graminis). Common but not serious at Huntley and Bozeman.

Stem-rust (Puccinia graminis) on Marquis wheat. Mild infections in late-planted fields in Fallon and Wibaux Counties. No damage is expected. None seen in early-planted fields.

Foot-rot (Helminthosporium sativum). Abundant in fields of Turkey wheat. Most farmers planted late enough to control it fairly well. Damage this year probably will be around 5 to 25 per cent in Judith Basin County. Losses negligible in Gallatin and Wibaux Counties. In Hull County serious on both Turkey and Marquis varieties.

BARLEY

Loose-smut (Ustilago nuda). Becoming more serious in Fallon and Wibaux Counties. Most fields contained 0.1 to 5 per cent infection.

Stripe (Helminthosporium gramineum). In a field of 60 acres 1 plant showed typical, severe symptoms. First typical case I have seen in Montana. Many farmers treat barley seed with formaldehyde or ceresan.

Covered-smut (Ustilago hordei) in Fallon and Wibaux Counties. Only traces seen in fields.

Stem-rust (Puccinia graminis). Traces in one ripening field in Wibaux County.

Foot-rot (Helminthosporium sativum). Serious in many fields of barley in Fallon and Wibaux Counties. Also serious in 2 fields in Judith Basin County.

FLAX

Heat canker (Physiological). Common in flax fields, usually killing 1 to 10 per cent of the plants.

Wilt (Fusarium lini). M. P. Ostby, Agricultural Extension Agent of Wibaux County has good evidence that it is sometimes serious there. Flax wilt killed the center of one plot of flax at Bozeman.

(P. A. Young, July 25)

ERGOT OF RYE IN NEW YORK STATE

In Schenectady County on August 12, I found one rye field that had a very large percentage of ergot. This disease seems much more severe this season than usual. At least the firms who buy rye say that in cleaning the seed they have an unusually large amount of ergot sclerotia. It is so common that we have received requests for information regarding the sale possibility of this ergot. (Charles Chupp)

OTHER REPORTS ON DISEASES OF CEREALS

Corn smut (Ustilago zeae) in Connecticut. Uniformly prevalent all over the State. (A. A. Dunlap, August 15).

Stem-rust of oats (Puccinia graminis)in Washington. This is the first record which we have of stem rust of oats in the Palouse Country. Field of Markton on the College Farm showed at least 10 per cent of culms infected at harvest time. No records of barberry stage. (F. D. Heald, August 15)

DISEASES OF VEGETABLE CROPS

VEGETABLE DISEASES IN THREE COUNTIES OF NEW YORK

by Charles Chupp

On August 11 to 13, I made farm visits in Albany, Schenectady, and Washington Counties to see what vegetable diseases were present. Because of the extremely hot, dry weather some of the common troubles like cucumber scab, tomato leaf spot, and similar diseases were lacking almost entirely but there were other troubles that were more serious than usual. Cucurbit mosaic is very prevalent in both Schenectady and Albany Counties. I found one field where there was 100 per cent of mosaic but I could find no weed hosts in that particular locality. Therefore, I could not determine the source of the infection. Many of the men who grow their young plants in greenhouses are careless about weed hosts so that they get an abundant supply of tomato mosaic and cantaloupe mosaic on the young plants before they are set into the field.

On one farm in Schenectady County where the tomato grower had saved seed from his crop for many years he had the common tomato canker. He stated that 35 years ago he had a disease that looked like bacterial canker. Since that time the

same trouble has appeared at least twice before the present season. On a seed farm 99 varieties or strains of tomato plants were examined. Nearly all of these were remarkably free of disease. One variety among all of these, however, was rather severely affected with the Macrosporium leaf spot (early blight). This was Way-a-head, a variety of the potato leaf type.

Black rot of cabbage is fairly common but because of the hot, dry weather the symptoms are so nearly like those of cabbage yellows that it was impossible for me to determine definitely which of the two diseases it was without making a microscopical examination. Very few men in this section of the State treat their cabbage seed before planting. On one farm which was located on the Hudson river bottom, one of the cabbage fields showed a large percentage of cabbage yellows. This disease is rare in the State, but in this particular case caused as much as 75 per cent loss. Apparently the fungus has been disseminated by flooding in the early spring.

SCLEROTIUM ROLFSII ON POTATOES IN TENNESSEE

J. A. McClintock reports that this fungus appears to be causing more or less trouble each season in the spring crop of Irish potatoes in the western part of the State. To his knowledge this has been occurring each year for the past seven or eight years. This is the first actual report of this disease from Tennessee. (August 19)

VEGETABLE DISEASES IN WASHINGTON

TOMATO

Leaf-mold (Cladosporium fulvum). Reported from two different west side greenhouses, Bremerton and Bothel.

Streak (virus). Reported from three different greenhouses, Seattle, Spokane and Vancouver.

Wilt (Sclerotinia sclerotiorum). Found in small amount in two different greenhouses, Spokane and Mount Vernon.

Bacterial canker (Aplanobacter michiganense). About 10 acres of tomatoes (John Bur) show about 30 per cent loss of crop from this disease in the vicinity of Clarkston. The seed was obtained from an Illinois seed house. The rest of the acreage in vicinity is free from the disease where other seed was used.

Western yellow blight (Beet curly top-Virus). Some 100 Acres of tomatoes in vicinity of Clarkston, Washington, average about 25 per cent of plants badly affected with western yellow blight. Tomato plantings in vicinity of Pullman heavily affected.

BEET

Mosaic (virus). Plantings of mother beets for seed in vicinity of Mount Vernon, show from 4 to 100 per cent mosaic. Average percentage infection for the district about 60 per cent.

(L. K. Jones, August 15)

VEGETABLE DISEASES IN CONNECTICUT

TOMATO

Early Blight (Alternaria solani). Found in a few places.

Mosaic (Virus). Very slight injury reported.

PEPPER

Mosaic (Virus). Little injury reported.

CUCUMBER

Bacterial wilt (Bacillus tracheiphilus). Small amount found in few localities.

POTATO

Tip burn. Very prevalent over the State.

(A. A. Dunlap, August 15)

VEGETABLE DISEASES IN MONTANA

BEAN

Mosaic (Virus). Seriously abundant in some fields near Huntley.

BEAN - Garden Varieties

Halo blight (Bacterium medicaginis phaseolicola). Becoming serious in garden varieties grown experimentally at Bozeman. Seen in a garden at Benchland (Judith Basin County) on July 15, 1930.

CELERY

Yellows (Fusarium ?) Serious in celery fields in Gallatin and Missoula Counties. Probably limited to Golden Self-Blanching and Golden Plume varieties.

SUGAR BEET

Black root. In a 10 Acre field 1 per cent of plants wilting; ends of tap roots black and rotten.

(P. A. Young, July 22)

DISEASES OF SPECIAL CROPS

SURVEY OF TOBACCO SEED BEDS IN MASSACHUSETTS

by W. H. Davis

The tobacco industry in Massachusetts is principally confined to a valley, which is situated in the western part of the State bordering each side of the

Connecticut River. This valley is about two miles wide in the northern part of the State, sixteen miles wide near the center at Northampton and twenty-five miles wide near the southern border where it enters the State of Connecticut. Below its center at Northampton, the valley is crossed by the Holyoke and Tom mountain ranges. The elevation of the valley above sea level varies from nearly 200 feet at the south to 400 feet at the north; the river remains under 200 feet elevation. The mountains, which in reality are hills, vary from 900 to 1,200 feet above sea level. Thus the tobacco growing area in Massachusetts is a large triangle with its base on Connecticut and the apex between Vermont and New Hampshire, occupying an estimated area of 500,000 acres upon which about 10,000 acres of tobacco are grown.

Soils: There are three general classes of soil; glacial, as drift or till; dynamic, as gravel and coarse sands; sedimentary, as remains of prehistoric lakes, ponds and streams or the sands, silts and clays. There are 14 types of soil in this area and one of the best for tobacco culture is the Norfolk coarse sandy loam.

Climate: The average temperature during the tobacco growing season from May to September is about 70° F. and the monthly precipitation about 4 inches. Generally, the crop is set during the first week in June and harvested in August or early in September.

Results of the Seed Bed Inspection

Fifty seed beds were chosen to represent conditions in the whole tobacco growing area and inspected. From these seed beds the growers planted nearly 1,000 acres of tobacco. Excluding four large plantations of 45, 75, 87, and 97 acres, respectively, each grower averaged a planting of 7 acres.

Seed: Of the fifty growers visited, 10 purchased their seed and 40 grew their own, 4 had their seed cleaned, or "blown"; not one sterilized tobacco seed and but 1 reported a seed germination test.

Soil sterilization: Of the fifty growers, 13 sterilized the soil in the seed beds by some means; formaldehyde, 1; steam, 9; acetic acid (applied under supervision of a scientific investigator for collecting data) 3; seed bed rotation, 3.

Fertilizers: Practically all fertilized the seedlings, using either "cotton seed meal," "fish" or nitrate of soda, but most of them employed a "special preparation" from a nearby fertilizer concern.

Spraying and dusting: 10 sprayed or dusted the seedlings; 5 sprayed with liquid Bordeaux, while 5 dusted with powdered Bordeaux. Three had copper dust but did not apply it.

Diseases: Wildfire was observed in only one seed bed from which it was transplanted to the field, where over 30 per cent of the plants in 14 acres were infected with the disease. Black root-rot was reported in 4 beds from one vicinity; damping off in 3 beds and a trace of mosaic in 3 beds; there was considerable sashburn in 5 beds, and in one so bad that the grower was forced to purchase plants. One grower covered his sash with cloth during hot spring weather and some spoke of utilizing the shade of trees to protect the beds. Fertilizer difficulties were encountered in 8 beds; 3 beds were severe and 5 moderately so.

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SURVEY OF TOBACCO SEED BEDS IN SOUTHERN INDIANA

by R. W. Samson, Botany Department,
Purdue University Agricultural Experiment Station

This survey was made during the week of May 25. Most of the growers were just starting to set their tobacco at this time and only a small part of the intended acreage had been planted. The dry spring had delayed setting in a number of ways. Because of the average poor condition of the seed beds and the general absence of fungus and other parasitic diseases, both apparently due to drought, the survey was terminated after four days in the field. In this time a comprehensive survey was made of the beds in the four counties of Warrick, Spencer, Floyd, and Clark.

In Warrick and Spencer Counties many beds were practically total failures. Only a few that had been watered judiciously or were located in well protected places had good stands of plants. Some growers were cutting down their acreage because of scarcity of plants. Others could not get their fields into shape for setting or the fields were too dry for plants to be set without watering. Practically all plants are set by hand in these counties. In Floyd and Clark Counties rainfall had been more favorable and the seed beds in general looked better. More beds, for instance, had been watered. A greater percentage of the intended acreage had been set also. Even here, however, the effects of dry weather could be seen in occasional thin, uneven beds.

General Practices in Relation to Disease

Location of beds: The majority of the growers change their bed sites each year. Most of them chose a place this year in or near woods. This was done for three reasons, namely, nearness to fuel for burning, new soil, and protection from wind. Some chose more or less open sites, often near barns, a few had their beds located in the garden. No virus diseases were observed in any of the beds but potatoes and mosaic pokeweed were found near many beds.

Sterilization of soil: The majority of growers burned their beds. Thirty minutes probably was the average time of burning. This did not destroy all weed seeds for most of such beds were weedy. An interesting case was found where three beds in an old hog lot had not been sterilized in any way this past spring. The plants in one bed showed pronounced potash starvation symptoms. The plants in the other two beds looked green and normal. It turned out that the latter two beds were two years old and had been burned the previous year.

A number of growers of dark tobacco in Spencer County had steamed their beds. These were somewhat more free of weeds. Most of the growers interviewed indicated that they preferred burning evidently because it involved little or no cash outlay.

A few growers used no means of soil sterilization. In most of such cases weeds were pretty bad in the beds.

Construction of frames: Practically all beds examined were about 9 feet wide, thus requiring three widths of the "tobacco cloth" for a covering. A few growers used boards for the frames; little or no new lumber was observed in use. Most of the frames were constructed of poles or rails resulting in rather low sides. Two beds were observed with frames of logs 8 to 10 inches in diameter. The plants in these beds looked considerably better, apparently due to the better protection. As a rule the frames were not very tight, allowing insects to enter rather readily. Sterilization of the frames was unheard of by most of the growers.

A loosely woven "tobacco cloth" was used as a covering for most beds. A

heavier cloth would undoubtedly have conserved the moisture much better. Mostly new cloth was used although an occasional bed was covered with old cloth.

Selection and treatment of seed: Most of the growers purchased "treated" seed from a seed company. This seed was supposed to be root-rot resistant and also treated against various other diseases. A few growers raised their own seed but did not clean it in any special manner. No growers treated their seed before planting.

Fertilizers

Quite a number of growers used a so-called tobacco fertilizer of 3-8-6 analysis. The rate of application was probably about one hundred and twenty five pounds to each 900 to 1,000 square feet. Over half of the growers did not use any complete fertilizer. The majority made one or more applications of sodium nitrate at various times in varying amounts.

Presence of Disease

Drought injury: The dry spring was responsible for considerable injury to the tobacco beds in southern Indiana. The actual extent of damage was hard to estimate in many cases. Sometimes a very thin stand was due to drought. In many cases the plants were thin and uneven in size. In practically all cases growth had been slowed up very considerably. Losses from the effects of drought were estimated on the basis of the percentage of plants that would do to transplant before the end of the planting season.

Fungus and other parasitic diseases: Leaf spots were found on a few plants in several beds that may have been due to wildfire or some other parasitic organism. The symptoms were not entirely typical however. No traces of root-rot were found. Apparently the dry weather inhibited the development of parasitic troubles.

Virus diseases: No mosaic or other virus-infected tobacco plants were found in any of the beds examined. Potatoes and mosaic-infected pokeweed were found near many beds, however. Also, most of the growers and workmen were observed to be chewing tobacco. No doubt, chewing tobacco will serve as an important source of mosaic infection during the coming season. It will be of interest, also, to note whether the mosaic from pokeweed will be transmitted to tobacco, assuming that it is the cucumber mosaic virus that is occurring in pokeweed.

Conclusions

In general, it was found that the tobacco growers of southern Indiana pay little attention to disease. Most of them have heard of "wildfire" and "root rot". Some of them evidently confuse "wildfire" with either dry weather firing of the lower leaves of tobacco plants in the field or with tobacco mosaic, indicating a very hazy idea of what it is. One tobacco dealer claimed that diseases were not as prevalent in southern Indiana as in Kentucky because tobacco had not been grown as long in the former region. Most of the growers rotate their tobacco fields, not following tobacco with tobacco as a rule. This coupled with the fact that most plant beds are located in new ground each year may mean that fewer diseases do occur.

TOBACCO DISEASES IN CONNECTICUT

Hail injury. Reported to have caused a million and a half dollars damage in the State during three storms.

Mosaic. Very little this year.

(A. A. Dunlap, August 15)

DISEASES OF HOPS AND COTTON

Downy mildew (Peronoplasmopara humuli) of hops in Washington. Reported from Puyallup by Mr. Newton on June 4. This is the first record we have of the occurrence of this disease in Washington. (F. D. Heald, August 15)

Rust (Cerotelium gossypii) in Arizona. Cotton rust has appeared at Coolidge, 65 miles northwest of Tucson, and at Sahuarita, 20 miles south of Tucson. A small acreage is affected. (J. G. Brown, August 15)

DISEASES OF TREES AND ORNAMENTALS

DISEASES OF TREES AND ORNAMENTALS IN WASHINGTON

SYCAMORE

Winter injury. Street trees in one subdivision of Spokane were sycamores, planted about 20 to 24 years ago. Soil thin, later concrete paving with cement walks and very narrow parking strips. Trees at present show reduced foliage, small leaves, and dead branches, but none of the trees killed outright.

TULIP

Botrytis blight (Botrytis tulipae). Blight was very severe at Pullman on one large planting. The disease has been fairly common in western Washington but this was the first severe case reported for eastern Washington.

ASTER

Wilt (Fusarium sp.) In one large planting at Pullman, wilt has caused nearly a 50 per cent loss, and at the present, many plants that have not been killed are badly dwarfed. The disease has been especially severe on the early varieties, such as Queen of Market, and Early Wonder.

HOLLYHOCK

Rust (Puccinia malvacearum). Very severe this season in the vicinity of Pullman; also reported from other portions of the State. Favored by the abundant rains in the earlier part of the season. At the present time many plantings are nearly defoliated.

(F. D. Heald, August 15)

OTHER DISEASES OF ORNAMENTALS

COTONEASTER

Fire blight (Bacillus amylovorus). Cotoneaster branches with blighted tips and leaves collected by D. C. George of Phoenix, Arizona, gave the fire blight organism, which was successfully inoculated into Loquat (Eriobotrya japonica) (J. G. Brown, August 15)

IRIS

Leaf spot (Heterosporium gracile). Moderately prevalent this year in Connecticut. (A. A. Dunlap, August 15)

ASTER

Wilt (Fusarium sp.) Asters were observed affected with Fusarium wilt in Virginia on July 16. (A. B. Groves, July 16)

SPECIMENS RECEIVED

Bacterium holci on Holcus sorghum sudanensis, Cochise County, Arizona, M. O. Rundell.

Cercospora cruenta on Phaseolus aureus (mung bean), Mississippi, Roland McKee. A new host.

Colletotrichum pisi on Pisum sativum, Bethel, Maine, Donald Folsom. First record for the State.

Dothichloe atramentosa on Sporobolus berteroanus, Wiggins, Mississippi, R. J. Haskell.

Fasciation on Medicago sativa, Glasgow, Montana, P. A. Young.

Gymnosporangium germinale on Pyrus communis, Taylor, Texas, J. J. Taubenhaus.

Melampsoropsis ledicola on Picea pungens, Greenville, Maine, M. S. Bowen.

Tylenchus dipsaci on Galanthus. England. D. P. Limber (Washington Inspection House.